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"Mapping the Mountain State"

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October 6, 2017

The Honorable Ajit Pai
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Filing of Comment by the West Virginia Office of GIS Coordination
Public Notice for Modernizing the FCC Form 477 Data Program
WC Docket No. 11-10; Document Number 2017-17901

Dear Chairman Pai:

Thank you for the opportunity to comment on the Modernization of the Federal Communications Commission Form 477 Data Program. Your efforts to improve this process are encouraging and have the potential to facilitate the expansion of access to high-capability broadband services throughout the State of West Virginia, and throughout the nation.

The West Virginia Office of GIS Coordination (WVGIS) understands the substantial impact of this notice of proposed rulemaking in terms of its subsequent and resulting requirements. The WVGIS is optimistic that existing policies will be adjusted to facilitate the expansion of access to high quality broadband services throughout West Virginia through the availability of more accurate data.

Previous planning and mapping efforts have proven that reliable and accurate data is crucial to our mission to provide broadband to underserved and unserved areas. Better data collection will result in better understanding of broadband access in West Virginia and the throughout the nation, when this data is made available to and utilized by policy makers, stakeholders, funding agencies and providers.

The WVGIS maintains close affiliation with the West Virginia Broadband Enhancement Council (the Council). It is through this work with the Council that the WVGIS has a thorough understanding of the limitations of current data reporting methodology. The WVGIS is committed to ensuring the accuracy of data. Given the public reliance upon government entities to provide accurate and reliable data, the importance of accurate data cannot be overstated.

The technical comments provided herein offer responses to the specific technical considerations of the Commission in its mission to expand broadband service to unserved and underserved areas. The WVGIS supports this mission and is uniquely qualified to directly address these considerations.

The WVGIS appreciates the Commission's continued support of initiatives designed to enhance broadband service, particularly in the State of West Virginia, where lack of reliable service remains, especially in rural areas.

The WVGIS understands the challenges associated with the Form 477 Data Program and offers specific solutions to these challenges. Responses in this document are numbered according to those

provided in the Notice, as follows:

3. ***In undertaking this examination of the Form 477 data collection, one of the primary objectives is to ensure that the data the Commission collects are closely aligned with the uses to which they will be put, both by the Commission and by outside stakeholders.***

The West Virginia Office of GIS Coordination (WVGIS) affirms that state broadband agencies, councils and authorities, and state attorneys general offices should be granted access to the data, including the Universal Service Administration Company's (USAC) Broadband Deployment Data by State, currently available only to State Utility Commissions.

4 through 7. ***Enhancing the Current Data Collection as it relates to mobile broadband service and the actual consumer experience.***

The WVGIS maintains that requiring providers to submit data on a sub-census block level is crucial to understanding and evaluating gaps in coverage, especially in rural areas where census blocks can be quite large. In this regard, data should be made available for mobile and fixed technologies in the same formats. The publication of mobile broadband speeds that are already being gathered as part of Form 477 data collection process would ensure that mobile providers are treated equally relative to non-mobile broadband providers that currently must report this information.

8. ***Should the Commission require filers to use predictive propagation models to prepare their Form 477 deployment filings?***

In a mountainous state such as West Virginia, requiring the submission of standardized propagation models for 4G LTE and later-generational technologies would allow detailed analysis by stakeholders. While a standard methodology for determining mobile and fixed wireless broadband coverage (signal propagation) is desirable, it may prove to be a difficult or burdensome requirement. In this case, filers should be required to describe the methodology employed to arrive at the coverage areas that they are reporting.

The Commission should consider guidance for best practices for both mobile and fixed wireless service modeling so that data users can see propagated models that reflect the actual coverage area and speeds available to the consumer. The specified speeds should at minimum include tiers at two Mbps intervals. The WVGIS believe the edge should be four Mbps. Most of the current funding opportunities provided by the Federal government require or include this speed as the baseline when defining unserved, underserved and served areas. An upload of one Mbps would be compliant with funding opportunities mentioned above.

All speeds should be made publicly available to inform policy and funding decisions, and to not give preference to broadband service providers according to the types of technology they have deployed. Access to USAC's Broadband Deployment Data by State intended for public utility commissions should be expanded to state agencies that are required by state statue to submit reports to their Legislatures, as is the case in West Virginia.

10. ***Supplemental Data Collections with On-The-Ground-Data.***

The WVGIS asserts that collecting this data would not create nor add additional efforts for providers as this data is already collected. Because this data is used to inform funding decisions, the Commission should develop a data verification standard for each applicable technology to ensure the broadband service data is accurate.

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11. ***Incorporation of New Mobile Wireless Technologies.***

The Commission should consider collecting 5G data when services are being deployed or offered in conjunction with a data package. Accordingly, 5G is a technology that offers higher speeds and it should not be bundled with other technologies. The existing form should be designed for 5G mobile data to be collected when that technology is implemented. However, the form should be somewhat open ended to allow providers to describe speeds and technologies utilized as the Commission determines an appropriate standard.

12. ***Mobile Satellite Broadband Service.***

Requiring a view-shed propagation analysis of satellite services should be mandatory. This analysis would consider satellite position in the sky and the use of the latest digital terrain elevation model for the area of service. If the Commission determines that this is a burden then it should at the very least require data related to provider's satellite actual position in the sky so the Commission and, policy makers, and researchers can perform the view-shed propagation studies.

13. ***The 2013 Form 477 Order, while modernizing the data collection generally, also ensured that, for the first time, the Form 477 data collection would require the submission of mobile broadband deployment data.***

This requirement should remain.

14. ***Under the current Form 477 reporting framework, facilities-based providers of mobile wireless broadband service are required to submit shapefiles depicting their broadband network coverage areas for each transmission technology deployed in each frequency band.***

The fact that the Commission has not used the spectrum band information it has collected does not demonstrate the need to eliminate the requirement. This does, however, demonstrate the need for the Commission to include this information in its coverage analysis.

15. ***The Commission proposes to eliminate the requirement that mobile broadband providers submit their broadband deployment data by spectrum band.***

Collecting spectrum data in different shapefiles would not create nor add additional efforts for providers as they already collect this data as part of their business.

Moreover, currently the Commission is not aware of any significant purpose for which these data might be used, although the Commission seeks comment on whether to continue to collect these data as they might be helpful for analysis in future proceedings.

The question would be how the Commission, policy makers, and other researchers would be able to connect the list to a "single" shapefile.

Would this approach be less burdensome than the requirement to submit shapefiles for each spectrum band, particularly for smaller providers?

No, this data is already captured.

Would this approach be beneficial by providing data that would allow the Commission to track more easily new spectrum deployments?

If the Commission requires one shapefile with bundled spectrums, the Commission would not be able to track new spectrum deployments.

Would it, for instance, provide a valuable source of information regarding the timing and

provision of LTE on 3.5 GHz spectrum as well as the deployment of 5G services in the various low, mid, and high spectrum bands?

Spectrums should not be bundled together.

16. ***Additionally, the Commission seeks comment about whether to eliminate or modify the requirement that mobile broadband providers report coverage information for each technology deployed in their networks. Are these categories defined and distinct enough to ensure accurate and meaningful reporting?***

Yes.

Are the distinctions between categories, such as 4G versus 5G, clear enough for the data to be meaningful and for respondents to accurately submit data?

Yes.

Will the Commission need to specify which technologies correspond to which category?

Yes.

Currently, the Form 477 instructions set out specific technology codes for nine different mobile technologies. In the Commission's experience, the separate reporting of coverage information by every one of these nine specific mobile technologies has not added useful information for the purposes of Commission decision-making, and such information is not currently used in its analysis of the data received. The Commission seeks comment on whether eliminating the requirement or modifying the information required to be reported in this manner would be a significant reduction in the filing burden.

As the Commission continues to collect broadband coverage data through the Form 477 process, the reporting of mobile broadband coverage information should be simplified using categories more directly aligned to consumer understanding of available coverage and their actual user experience, with specific designations for 3G, 4G Non-LTE, and 4G LTE. However, the data should be accompanied by speed data. The Commission should also specify which technologies fit into each category so that data users can understand the data collection method.

a. In addition to speed, the Commission should consider other factors, including the type of technology, latency, cost, competition, data caps and potential usage. It is suggested that the Commission create an Availability Index, using data points listed below, to determine access and reasonable deployment.

b. Infrastructure or type of technology
c. Latency, whether low, middle, or high, based upon technology averages
d. Cost
e. Competition and its effect on innovation and affordability
f. Data caps
g. Potential Usage (videos, number of devices)

Creating an index would give a more accurate diagnosis of the county's broadband health. This may be more comprehensive than determining access, but it would more accurately assess the deployment of broadband and not just internet access or access to a speed threshold. How valuable is access if the cost of service is prohibitive and only one provider serves the location?

17. ***The Commission turns next to its consideration of mobile broadband service availability data. Currently, mobile broadband providers are required to submit data where their service is "available."***

This also creates a false sense of where service is available.

18. ***The Commission's experience with the collection of this information, however, has shown that the mobile broadband service availability data that providers submit generally do not reflect their local retail presence.***

The Commission should require providers to submit their real local retail presence in addition to service availability. This would aid policy makers in determining how to serve consumers not located in retail service areas but located in "available" areas. This would also aid providers in making decisions on future growth

19. ***The Commission seeks comment about how the Commission might revise its data collection on the deployment of mobile voice services.***

These requirements should not be changed.

20. ***The Commission continues to view the collection of mobile voice deployment data as important for tracking changes in the mobile landscape and informing the Commission's analysis of mobile voice services that are available to consumers.***

Technology and spectrum band determine the level of service a consumer receives.

Is the distinction between voice and broadband coverage significant, or do providers most often include mobile voice coverage wherever they have some form of broadband coverage?

Yes, the distinction between voice and broadband is still significant.

If providers include mobile voice coverage wherever they have broadband coverage, should the Commission revise its requirements to allow providers to simply check a box indicating that they provide voice coverage wherever they have a particular mobile broadband technology?

No, voice coverage should be kept separate.

How would the Commission account for areas in which a provider provides only mobile voice services?

In support of public safety and rural economic activity, it is still valuable to gather coverage information for service categories below 3G that support voice and/or texting. This data should include geographic data on where these services are available.

24. While the Commission's 2011 Form 477 NPRM, 76 FR 10827, February 28, 2011, raised the issue of requiring mobile subscribership reporting at a more granular level, the 2013 Form 477 Order did not change the state-level reporting requirement.

Providers should be required to list the number of subscribers on any given census block. The CSV should include a field that indicates the number of subscribers in that census block.

25. ***Would collecting subscribership data at the census-tract level be sufficient to improve the quality of the Commission's data on subscribership?***

Aggregation of actual subscriber-count data within established speed tiers, perhaps using the tiers established under the National Broadband Map, would provide a useful benchmark for policy considerations and to have a more informed market for broadband services. This information could also assist in assessing broadband adoption levels. Counts should be publicly reported as a

total across all providers, both nationally and by state, with complete anonymity with respect to individuals and their service provider. However, state and federal programs should be able to use the raw data, under non-disclosure provisions, to assist in determining true level of service and competition for Universal Service Fund decisions.

28. ***Should the Commission require filers to report the maximum bandwidths of business service offered in a given census block and indicate whether the service is best efforts and/or contractually guaranteed?***

Discontinuing the reporting differences between consumer and business/enterprise/government services within the Form 477 filing simplifies the process for industry without degrading the insight gained from the filing. However, providers should be required to indicate any service and coverage that is exclusively marketed to business customers, and not available for residential customers. The Commission should also require reporting the number of businesses served within a census block.

30. ***It seeks comment on whether all fixed broadband providers should be required to identify on Form 477 three categories of service areas for each technology code: (1) Areas where there are both existing customers served by a particular last-mile technology, and total number of customers using that technology can, and would, be readily increased within a standard interval upon request; (2) areas where existing customers are served but no net-additional customers using that technology will be accommodated; and (3) areas where there are no existing customers for a particular technology but new customers will be added within a standard interval upon request.***

A fourth and fifth category would complement the ones mentioned above. This would include the number of current subscribers in that census block, and the number of customers using the technology that would readily increase within a standard interval upon request. This would only require two additional fields in the CSV.

34. ***Should the Commission assume that the fraction of a partially served block with the service correlates with a fraction of homes within that block that have service?***

Despite the difficulties with collecting street-level or specific location data from providers, an attempt should be made to collect more granular data from providers. If the current collection methods remain the same the providers should state the number of locations they are capable of serving. A more statistically accurate calculation could then be made using Census household data.

If the Commission decides to continue gathering data at a census block level it should require that providers list a census block as served based on a percentage of possible customers within the census block. For instance, census blocks where at more than 75 percent of possible homes and businesses are served it should be marked as served. Census blocks within a range of 40 percent of possible customers served to 75 percent of possible customers are served could be marked as underserved. Census blocks where less than 40 percent of the possible customers subscribe could be marked as unserved.

Accurate data collection is crucial to evaluating and encouraging the expansion of broadband services. Programs administered by the Commission, the National Telecommunications and Information Administration (NTIA), the U.S. Department of Agriculture (USDA) and other federal and state agencies rely on the accuracy and precision of mapping data. The Commission should consider refining its broadband data collection processes to meet the needs of funding and

planning efforts at all levels of government.

Basing data collection, planning efforts, and funding decisions on census blocks under the current methodology is problematic. This is particularly damaging in large, rural census blocks with challenging terrain. These characteristics present challenges in states like West Virginia. Under the current Form 477 submission process, any census block that is partially covered would be ineligible for all federal broadband programs, even if only a small percentage of households or census block area is covered.

It is strongly suggested that the Commission work with providers and state broadband mapping programs to coordinate data collection and mapping efforts to collect actual provider service footprints. These footprints could be collected through either shape or raster files (provided raster cells are sized small enough to make the data meaningful).

Guidelines and specifications should be developed and basic tools and documentation should be made available. Collecting this more refined data will ensure that projects designed to reach unserved residents and businesses in partially covered blocks are included in broadband planning efforts and eligible areas for available funding.

The difficulty found by stakeholders that have no GIS capabilities when trying to assess broadband service in their community points to the need of updating of the National Broadband Map.

Other data deficiencies exist with the current Form 477. Among the most notable are the length of time between receipt and publishing, and the preferential treatment given to mobile wireless service providers by not publishing speed data. This makes it difficult for state and local planning entities to evaluate local broadband needs. The Commission should work with states to display more refined data when available on the National Broadband Map.

35. The Commission also seeks comment on collecting data at a sub-census-block level. While collection of data by street address, for example, could increase the complexity and burden of the collection for both the Commission and the filers, the Commission seeks comment on the scope of this burden and potential corresponding benefits.

The State of West Virginia maintains statewide datasets that could be used by providers when submitting more granular data.

The National Emergency Number Association (NENA) in conjunction with other geospatial organizations and the Commission have been working on the development of a national address dataset in preparation for NG911 and FirstNet. The U.S. Department of Transportation is partnering with other federal agencies, and professional organizations in the development of a National Address Database. In addition, the U.S. Census Bureau is currently working on the 2020 Census and as part of that it's working with all states and territories on its Local Update of Census Addresses Operation (LUCA) initiative. These efforts could be leveraged by the Commission to obtain more granular data.

Address formatting should be based on the NENA standard. This standard was developed to meet NG911 and FirstNet needs and includes a three-dimensional (3D) data-point standard for multi-family and multi-level dwellings.

36. ***As an alternative, the Commission seeks comment on whether it should require providers to geocode all the addresses at which service is available?***

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a. If the address has not been identified with a lat-log, providers will have the same geocoding problem as the Commission when locating those addresses.
b. Both methodologies would work. But field gathered lat-log tied to the NENA addressing standard would be more accurate.
c. If the NENA addressing standard is followed this problem would be minimized.
d. In the case of fixed wireline providers, they should. This is somewhat difficult when dealing with mobile because billing may go to a P.O. Box and not to a fixed address in some rural areas.
e. If providers follow the same standard, there should not be a problem

37. The Commission also seeks comment on other sub-census block alternatives, such as collecting data about what street segments providers cover.

Though street segments with address ranges would be beneficial because they would allow the understanding of service availability, the well-articulated precision issues mentioned in this section of the FNPRM, the use of road centerlines to express broadband service availability would be a cumbersome and otherwise mediocre solution at best. Street segments were used by States while developing their own State Broadband Initiative mapping programs funded by NTIA. Though street segments were collected only for those census blocks larger than two square miles. Since fixed providers have their infrastructure mapped, and when providing last mile service to a home or business they in general use public streets this should not be a burden. Number of customers served and number of potential customers should also be provided for each street segment

39 through 40. How burdensome would it be for providers to make such a determination for each block in their footprint? In sum, the Commission seeks comment on whether it should move to a more granular basis for reporting deployment data and, if so, what basis would be appropriate.

As the Commission continues to mandate provider reporting of broadband services through Form 477, the requirements, reporting process, and publishing timeframe should be streamlined to ensure the maximum benefit to industry and citizens, with minimum expenditure of resources.

The two primary map data layers that are most valuable to informing consumer experience, setting strategy, and managing investment to expand broadband capabilities are:

a. The providers' current capabilities (coverage, speed and technology), and
b. The precision location of unserved/underserved address points.

Taken together, these layers should emphasize last mile connections to locations where broadband service is not yet at expected levels.

The Commission should consider sustaining this dataset overtime, and should inventory address point locations that have been upgraded to meet national service level goals.

As part of their business, providers know where their infrastructure is located and how fast and if they can serve a population. Consumers call providers to inquire about service availability. It can be reasonably concluded that providers are aware of the locations they can and cannot serve and the associated timeline. This collection of data to determine the number of customers served and number of potential customers in a census block should also be mandatory

The Commission should support the use of existing address data sets and work with the U.S. Department of Transportation and its partner organizations in the development of a National Address Database on the National Address Data program. The cost of obtaining address data is

an existing cost as providers know the locations of their customers. Providers also have a billing address. Therefore, the cost of collecting this data to fit a given standard should not be significant. Until a nationwide address point data set is created, states, providers, and other stakeholders should be allowed to submit the precise locations (geographic coordinates and street addresses) of unserved/underserved points to the Commission.

47. The Commission proposes that certain collected data that are currently treated as confidential be made public.

This type of data should also be made available to the public, to aid in independent competitive analyses and better understand consumer experience for both mobile and fixed technologies. Maximum advertised speeds, for example, are currently marketed by providers and do not threaten proprietary information. Publicly publishing mobile broadband speeds that are already being gathered as part of Form 477 would ensure that mobile providers are treated similarly relative to their non-mobile broadband provider counterparts. This information is useful to business, government, and residents.

48. Similarly, the Commission proposes that, if detailed propagation model parameters are submitted in the Form 477 filings, some of these parameters should be treated as public information, as the Commission believes that such parameters are not competitively sensitive.

Terrain resolution, signal strength, and the loading factor are higher-level aggregate parameters and should not be treated as confidential as to allow replication of the results and better understanding of consumer experience and true coverage by policy makers. Propagation model results have already been made publicly available through past federal programs, specifically through the State Broadband Initiative programs and the National Broadband Map. Releasing model parameters would help federal agencies, states and other stakeholders assess data quality, consistency and broadband needs, as validating unserved areas is crucial in promoting broadband deployment in the private sector.

49. ***National-Level, Fixed Broadband Subscriber Counts.***

The WVGIS believes disclosure of the information mentioned in this section will be beneficial. The disclosure will allow analysis of the data by researchers and policy makers. [Since research and analysis will surely focus on service identity of individual provider may be kept out of the public dataset.] Though someone willing to check different provider's websites would be able to determine who the provider is. Aggregation of subscriber count data within established speed tiers, perhaps using the tiers established under the National Broadband Map, would provide a useful benchmark for broadband policy considerations and a more informed market for broadband services.

This information could help assess broadband adoption levels, for example. Counts should be publicly reported as a total across all providers, nationally and by state, with complete anonymity with respect to individuals and their service provider. However state and federal programs should be able to use the raw data, under non-disclosure agreements, to assist in assessing competition levels for Universal Service Fund decisions.

50. ***Release of Disaggregated Subscriber Data?***

Personal identifiable information (PII) if present should be left out. Individual service received by individuals should be aggregated by number of subscribers with the same service in a census block.

Non-disclosure agreements could be entered with researchers, state, or local entities that require additional access to conduct research related to the service offered by providers in particular areas. Regardless of the number of times the data is collected annually, the biggest issue with the timeframe is the amount of time it has taken for the Commission to release the data. Currently, the Commission has taken as long as 18 months to release data. The Commission should release broadband data within 6 months of the collection deadline.

What would be the public interest and legal justifications for releasing or not releasing different types of raw data files?

> Non-disclosure agreements could be entered with researchers, state, or local entities that require additional access to conduct research related to the service offered by providers in particular areas. Regardless of the number of times the data is collected, the biggest issue with the timeframe is the amount of time it has taken for the Commission to release the data. Currently, the Commission has taken as long as 18 months to release data. The Commission Should release broadband data within 6 months of the collection deadline.

The WVGIS appreciates the Commission's continued support of initiatives designed to enhance broadband service, particularly in the State of West Virginia. We request your careful consideration of the comments provided in this letter and thank you for your service to the Commission.

Respectfully,

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West Virginia Office of GIS Coordination

TS:kw
cc: West Virginia Broadband Enhancement Council